



Published weekly for employees of Lawrence Livermore National Laboratory

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A year of successes for national security missions

In his state of the Lab address in December, Director Michael Anastasio called 2003 a “very challenging and successful year.”

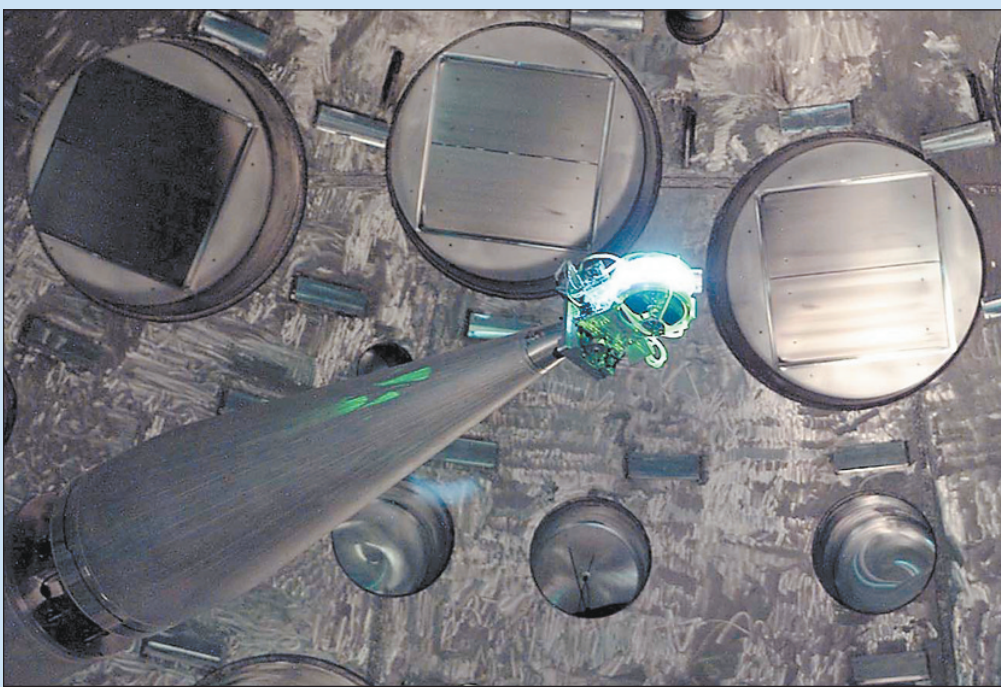
Highlights in science and technology (S&T), people and operations are listed month by month in this special “2003 Year in Review” edition of *Newsline*. The following pages summarize major achievements in the Laboratory’s core national security missions, as well as other key scientific achievements.

The Lab was able to meet its commitments to ensure the safety, security and reliability of the nation’s nuclear deterrent under the National Nuclear Security Administration’s Stockpile Stewardship Program. The program continued to produce innovative science and technology.

The National Ignition Facility, a key tool for stockpile stewardship, began a major transition. The giant laser facility completed “early light,” a demonstration of the full system’s performance on a per beam basis for the first quad of four laser beam lines. NIF conducted its first experiments and produced its first data.

NIF set a world record for laser performance by producing 10.4 kilojoules of ultraviolet laser light in a single beamline.

The Defense and Nuclear Technologies Directorate brought on line the JASPER gas gun at the Nevada Test Site (NTS), providing an additional facility for conducting shock experiments to better understand plutonium. Lab researchers also completed another subcritical plutonium experiment, “Piano,” in the U1A underground facility at NTS.



A look inside the cavernous 33-foot-diameter NIF target chamber as a target is being moved into position prior to an experimental shot.

nuclear, biological and chemical threats. Biowatch, a biodetection system developed by the Laboratory and Los Alamos, was deployed in cities across the United States.

Scientists and engineers also brought to fruition some new technologies for detecting nuclear materials. Rad-Scout, a handheld radiation detector developed by DNT, was licensed to Tennessee-based ORTEK in June. In a May ceremony attended by Rep. Ellen Tauscher, the Laboratory opened the Radiation Detection Center and appointed Simon Labov to be its director.

In a paper published in *Science*, the Lab’s Pat Fitch, Ellen Raber and Dennis

Imbro call recent technology development to counterterrorism “unprecedented,” though they noted that important challenges remain.

Hand in hand with homeland security, the Lab continued research and development in nonproliferation.

Laboratory programs also supported U.S. military operations in Iraq by providing intelligence analysis and capabilities such as CAPS, a tool for tactical war planning. Some 20 Lab employee reservists have been called up and are serving in Iraq.

For more information on the Lab’s achievements in 2003, see page 3.

Month-by-month review — Page 3

Homeland security

The Lab’s Homeland Security Organization, created in December 2002, took shape with appointments to key leadership positions early in the year by HSO Acting Director Wayne Shotts. The organization continued to provide support to the U.S. Department of Homeland Security, which officially opened its doors in March.

Lab-developed technologies continued to contribute to efforts to protect the homeland from

UC contract, Lab security and work/life balance highlight 2003

The University of California’s contracts to manage the national labs for the U.S. Department of Energy became the focus of attention in May when Energy Secretary Spencer Abraham announced that UC’s contract to manage Los Alamos National Laboratory would be competed for the first time.

In November, a provision in the budget authorization bill for the national labs requires DOE to compete the contract for five laboratories, including Lawrence Livermore and

Lawrence Berkeley.

UC has managed Los Alamos, Lawrence Livermore and Lawrence Berkeley national laboratories since they were created.

UC President Robert Dynes, who took office Oct. 1, indicated the University was preparing to compete for the contracts to manage the national labs. The UC Board of Regents in late October approved Dynes’ selection of retired Adm. Bob Foley as vice president for Laboratory Management.

In mid November, UC Regents approved in concept a proposal by Foley to create a board of directors, composed of experts in technical and business management, to help oversee management of the labs.

Earlier in the year, UC and the three Department of Energy national labs it manages, received strong support from a group of California and New Mexico state legislators during a

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**Newsline’s annual ‘Year-in-Review’ issue,
covering events at the Lab in 2003
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LAB COMMUNITY NEWS

Weekly Calendar

Technical Meeting Calendar, page 4

Friday
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A representative from **California Casualty** Insurance will be in the Benefits Office today. Appointments are required and may be scheduled by calling 2-9955. California Casualty offers individual rates to Lab employees by payroll deduction for auto and homeowner/renter insurance. As with any employee-paid insurance coverage, employees are encouraged to comparison shop.

Wednesday
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The Asian Pacific American Council (APAC) is looking for **donations of old/used cell phones** for its fund-raising activity. The funds raised will go toward the APAC Scholarship Fund. Donate your old/used cell phones (personal cell phones only, no government cell phones accepted) on Wednesday, Jan. 14, in front of the three cafeterias from 11:30 a.m.-1 p.m. Two other drop off points will be in Bldg. 694, room 1046, and Bldg. 151, room 1132, from Monday to Feb. 29. For more information, contact Barry Dahling, APAC Scholarship Committee chair, 4-4882 or Ricky Chau, APAC chair, 3-4388.

Thursday
15

Lawrence Livermore Laboratory Womens' Association annual scholarship awards ceremony will take place at noon in the Bldg. 543 auditorium. Tammy Jernigan, principal deputy associate director for Physics & Advanced Technologies, will present 10 scholarships to this year's recipients. Other presenters will include Edith Greene, a former scholarship winner. At the ceremony, LLLWA will present a new named scholarship for administrative excellence.

...

R&D 100 Awards draft entries, including photos/videos, are due to Lisa Chartrand today for the internal review process. Contact IPAC as soon as possible if you haven't already advised the organization that you will be submitting an entry. Contact: Lisa Chartrand, 2-2297, or chartrandl@llnl.gov or go to the Web at <http://www-r.llnl.gov/IPandC/emp/>



The **DNA of Teams** (ED7470) is a two-day workshop instructed by Frank Wagner from the UCLA Technical Management Program. This workshop, which will help you understand the key underlying structure that affects team success, is scheduled for Feb. 9-10 at the Training Center (Trailer 1879) from 8:30 a.m. - 4:30 p.m. Cost is \$775-1,325.

Classified ads to return next week

Due to this week's special edition, the classified ads will appear on the Web. Ads submitted prior to Jan. 7 need to be resubmitted to appear in the Jan. 16 edition of *Newsline*.

Edward Teller Education Center open house

The Edward Teller Education Center (ETEC) will hold an open house from noon to 1 p.m. Thursday, Jan. 15, Edward Teller's birthday. A brief ceremony marking Teller's birthday will take place at 1 p.m. ETEC will open the doors of its newly dedicated classroom facility for tours and demonstrations. Employees are encouraged to come and see displays and exhibits from a variety of education programs offered through ETEC, the Science, Technology and Education Program (STEP) and Public Affairs Office.

Information will be available on how LLNL



employees can participate in education programs, and educational opportunities available to Lab employees and their families. Lab scientists who have participated in the past will be available to discuss their experiences. STEP will present its newly developed online registration program for LLNL volunteers. The program is available to register current volunteers, as well as those interested in participating in future educational activities.

ETEC is located adjacent to Bldg. 661, outside the East Gate.

Technical Meeting Calendar

Friday
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CHEMISTRY & MATERIALS SCIENCE — FRONTIERS IN CHEMISTRY & MATERIALS SCIENCE
"Pushing the Self-Assembly Envelope to Create Biomimetic Materials and Functions," by Samuel I. Stupp, Northwestern University, Dept. of Materials Science and Engineering, Department of Chemistry and Feinberg Medical School; Institute for Bioengineering and Nanoscience in Advanced Medicine (IBNAM). 3:30 p.m., Bldg. 235 Gold Room (room 1090) Contact Mike Fluss, 3-6665, or Kristine Ramirez, 3-4681.

CHEMISTRY & MATERIALS SCIENCE

"The Geohydrology and Simulation of Ground-water/Surface-water Flow in the Santa Clara Valley," by Randall Hanson, U.S. Geological Survey, San Diego. 10:30 a.m., Bldg. 151, room 1209. Foreign nationals may attend if appropriate security plan is on file, which includes Bldg. 151. Contact: Jean Moran, 3-1478, or Rosa Yamamoto, 2-0454.

PAT/EETD PHOTONICS SEMINAR

"Temporal Signal Processing and Its Applications to A/D Conversion, Waveform Generation and Spectroscopy," by Bahram Jalali, UCLA. 1:30 p.m., Trailer 1885, room 1012 (badge required). Contact: Corey Bennett, 2-9394.

INSTITUTE FOR GEOPHYSICS & PLANETARY PHYSICS

"Non-Microlensing Applications of Microlensing Surveys: Galactic Extinction," by Piotr Popowski, Max-Planck Institute, Germany. Noon, Bldg. 319, room 205. Contact: Wil van Breugel, 2-7195, or Sharon Taberna, 3-6290.

INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"Approximate Query Processing With Sampling and Pre-Aggregation," by Christopher Jermaine, University of Florida. 10 a.m., Bldg. 451, room 1025 (property protection area). Contacts: Ghaleb Abdulla, (CASC) 3-5947, or Leslie Bills, 3-8927.

Monday
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PHYSICS & ADVANCED TECHNOLOGIES DIRECTORE-WIDE SEMINAR
"Information Transport and Computation in Nanometer-Scale Structures," by Don Eigler, IBM Fellow, IBM Almaden Research Center. 3 p.m., Trailer 2128, room 1000 (uncleared area). Contact: Fernando A. Reboredo, 3-2755.

H DIVISION

"Perovskite Manganites Exhibiting Colossal Magneto Resistance: From Thin Film to Nano-porous and -Hybrid Material," by Nam Hur, Center for CMR Materials; Korea Research Institute of Standards and Science. 10:30 a.m., Bldg. 219, room 163 (property protected area). Contact: Choong-Shik Yoo, 2-5848, or Donna Vercelli, 2-0976.

INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"Hybrid Systems: Discontinuous Dynamics in a Continuous World," by Thomas Seidman, University of Maryland, Baltimore County. 11 a.m., Bldg. 451, room 1025 (property protection area). Contacts: Daniel Reynolds,

(CASC) 2-4022, or Leslie Bills, 3-8927.

Tuesday
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ENVIRONMENTAL RESTORATION DIVISION
"Multi-rate Flowing Fluid Electric Conductivity Logging Method," by Chin-Fu Tsang, Lawrence Berkeley National Laboratory. 2:30pm, Trailer 4378, room 1014 (Novista). Contact: Souheil M Ezzedine, 2-0565.

LC CUSTOMERS MONTHLY MEETING

9:30 – 11 a.m., Bldg. 451 White Room (Open Area)
Contact: Teresa Delpha, 3-7329.

Thursday
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R&D 100 AWARDS
R&D 100 Awards draft entries, including photos/videos, are due by Thursday, Jan. 15. Advise IPAC as soon as possible if you will be submitting an entry. Contact: Lisa Chartrand, 2-2297.

Friday
16

INSTITUTE FOR GEOPHYSICS & PLANETARY PHYSICS
"The Theory and Practice of Measuring Star Formation Rates: Making Honest Men of the Madau Plotters," by Mike Dopita, The Australian National University. Noon, Bldg. 319, room 205. Contact: Wil van Breugel, 2-7195, or Josie Morgado, 2-7181.

INSTITUTE FOR SCIENTIFIC COMPUTING RESEARCH

"Monitoring Animal Behavior in the Smart Vivarium," by Serge Belongie, UC San Diego. 2 p.m., Bldg. 451, room 1025 (property protection area). For more information go to <http://www.llnl.gov/casc/calendar.shtml>. Contact: Imola Fodor, (CASC) 4-5420, or Leslie Bills, 3-8927.

Newsline

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A recap of events and achievements in 2003

Editor’s note: Below is a month-by-month recap of the major events of 2003, yet another year in which the Laboratory lived up to its motto of “science in the national interest.” This is a selection of events and achievements.

JANUARY

Science & technology

A replica of the Clementine satellite, which spent 70 days orbiting the moon in 1994 mapping and photographing the lunar surface, finds a new home in the Smithsonian National Air & Space Museum in Washington DC. Livermore helped develop the backup sensor components for Clementine.

The Laboratory’s new Homeland Security Organization Acting Director Wayne Shotts establishes six programs charged with developing technologies to reduce U.S. terrorism vulnerabilities in different areas.

The National Ignition Facility and the Physics and Advanced Technologies directorates unveil the Eyeglass 5-meter diffractive lens, the world’s largest lens to date, which is made up of 72 precisely aligned glass panels.

Raging wildfires destroy the Mount Stromlo Observatory in Canberra, Australia, home of the historic Great Melbourne Telescope, halting all Laboratory astronomy research conducted there.

U.S. Secretary of Energy Spencer Abraham announces that the United States will rejoin the International Thermonuclear Experiment Reactor (ITER), a project aimed at demonstrating the scientific and technological feasibility of fusion energy.

People

Dr. Edward Teller celebrates his 95th birthday.

Mary Kimberly Lawrence, better known as “Molly,” widow of Berkeley and Livermore Lab founder and namesake Ernest O. Lawrence, dies Jan. 6 at age 92.

Edward M. Rubin, an internationally known geneticist and medical researcher, is named director of the Joint Genome Institute.

Bob Schanilec and Donald Harrison of Lab TV receive national and international recognition for their video productions.

More than 25 teachers from throughout California attend a one-day workshop on photonics co-sponsored by the Lab, the International Society for Optical Engineering and the California Photonics Consortium.

Operations

Director Michael Anastasio unveils a list of 10 “values” to help guide the Laboratory in the fulfillment of missions and responsibilities. (See box at right.)

The UC Regents reaffirm their commitment to continue oversight of the labs.

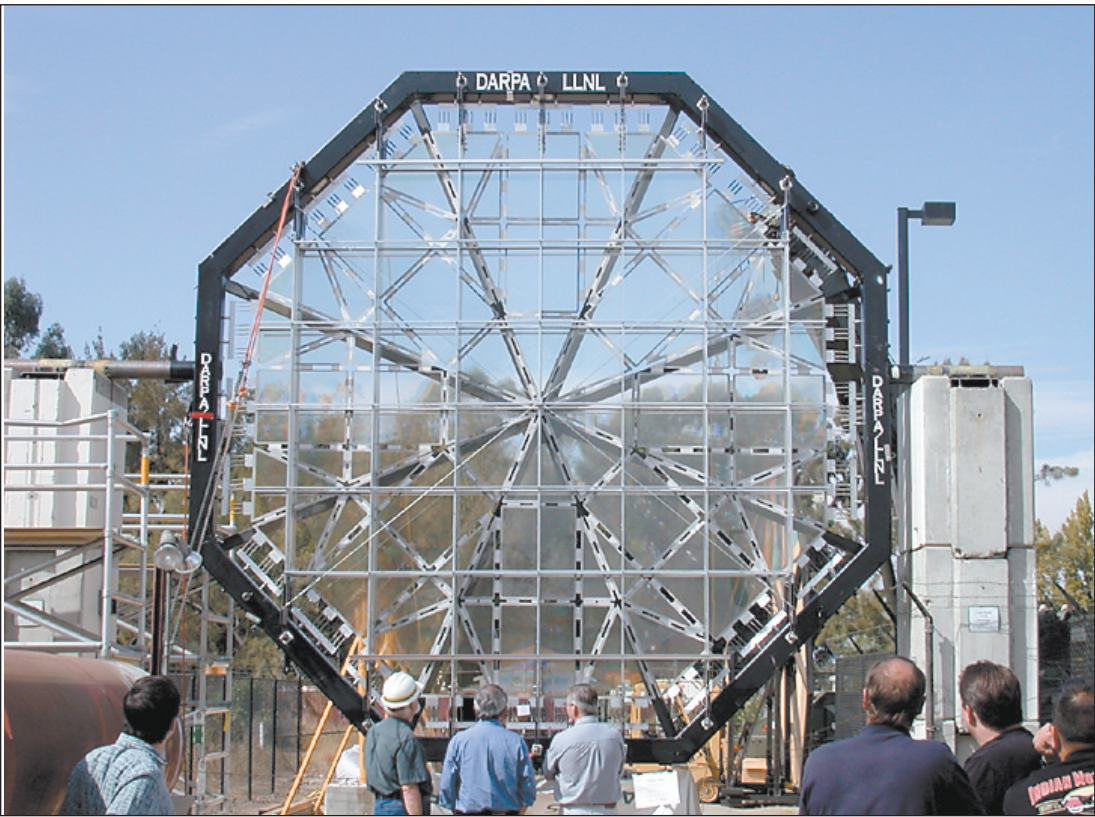
TeamNIF reaches a new safety milestone of two consecutive years without a lost workday. That translates to 2,559,803 total work hours (more than 1,200 worker years) without one worker losing a single day due to injury.

FEBRUARY

Science & technology

Lab and UC Berkeley researchers find that semen quality in adult men declines, suggesting that age plays a greater role in male fertility rates than previously thought.

Stewart Fallon of the Lab’s Center for Acceleration



Researchers from the National Ignition Facility and the Physics and Advanced Technologies directorates display the Eyeglass 5-meter diffractive lens to Lab employees.

Laboratory Values

- ◆ Passion for mission
- ◆ Integrity and responsible stewardship of the public trust
- ◆ Simultaneous excellence in science & technology, operations and business practices
- ◆ Balancing innovation with disciplined execution
- ◆ Teamwork while preserving individual initiative
- ◆ Intense competition of ideas with respect for individuals
- ◆ Treating each other with dignity
- ◆ A high-quality, motivated workforce with diverse ideas, skills and backgrounds
- ◆ Rewarding and recognizing performance
- ◆ Commitment to the collective success of the Laboratory

tor Mass Spectrometry, in collaboration with researchers from Australian National University and the Australian Institute of Marine Science, find evidence that sediment from runoffs has increased sharply in the 150 years since the first Europeans settled along the Australian coast, negatively affecting the Great Barrier Reef.

Livermore scientist Tom Isaacs, a member of the National Academy of Sciences’ National Research Council, gives a progress report on the Yucca Mountain nuclear waste repository at the 2003 meeting of the American Association for the Advancement of Science.

Using advanced computing capabilities, Lab engineer Robert Ferencz illustrates some of the issues that arise when mitigating the effects of a bomb blast on infrastructure during a presentation at the 2003 meeting of the American Association for the Advancement of Science.

People

The Columbia Space Shuttle crashes upon re-entry into the Earth’s atmosphere, taking the lives of Rick Husband, Dave Brown, William McCool, Michael Anderson, Kalpana Chawla, Laurel Clark and Ilan Ramon, all friends and colleagues of Lab employ-

ees and former astronauts Tammy Jernigan and Jeff Wisoff.

Laboratory scientists Claire Max and Ellen Raber are two of nine awardees inducted into the Alameda County Women’s Hall of Fame.

Former Secretary of State George Schultz visits the Lab for a full day of briefings, including a tour of NIF.

The Lab’s Engineering Directorate sponsors a one-day session, titled “Optical Engineering at the Lawrence Livermore National Lab,” as part of the International Optical Engineering Society’s Photonics West 2003 Conference.

The Federal Laboratory Consortium for Technology Transfer grants the Extreme Ultraviolet Lithography (EUVL) project an Excellence in Technology Trans-

fer Award for transferring to industry technology that will lead to microprocessors that are tens of times faster than today’s most powerful chips and create memory chips with similar increases in storage capacity.

The American Association for the Advancement of Science names former Deputy Director for Science & Technology, Jeff Wadsworth, and Craig Smith, a nuclear engineer and project leader in the Energy and Environment Directorate, 2002 AAAS fellows.

Robert Lawrence, son of Lab co-founder Ernest Lawrence, and his wife, Eleanor, tour the Laboratory and receive briefings on the Forensic Science Center, Medical Technologies, Homeland Security, the

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QUOTABLES

On the Lab

“Our founders, Ernest Lawrence and Edward Teller, imprinted on us the Lab’s genetic code — a code that has withstood the test of time for those 50 years.”

– Glenn Mara, deputy director, Operations

“The archives is not a place to warehouse old records, but a living collection that provides information Lab employees need to do their jobs.”

– Maxine Trost, Lab archivist

“Livermore is a great place to hold a workshop like this because the Lab can draw together a wide variety of views under the umbrella of academic discussion. It’s harder for government to do that.”

– Paul Longworth, deputy NNSA administrator, on CGSR’s “Atoms for Peace” workshops and conference

“Credibility is hard to earn, but very easy to lose, so let’s hang on to it.”

– Michael Anastasio in state of the Lab

“Good security for the Laboratory is good security for the community.”

– Dave Leary, on limited access to East Avenue

2003

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National Ignition Facility and Health Services.

Members of the Lab’s Safeguards & Security meet with Livermore Police Chief Steve Krull to discuss heightened security at the Laboratory.

More than 120 ROTC cadets and their faculty representatives visit the Lab as part of the annual ROTC Day hosted by the National Security Office and the Science & Technology Education Program.

Operations

Director Michael Anastasio unveils a modified performance management system, the Integrated Performance and Pay Program, and updates employees on various Survey Action Team commitments.

Secretary of Energy Spencer Abraham rolls out the Lab’s 2004 budget which shows strong support for Laboratory national security missions in stockpile stewardship and nonproliferation as well as some areas of science.

LLNL upgrades its security status to Security Condition (SECON) 2, which corresponds to the national “orange” alert status directed by the Department of Homeland Security.

CIO Ken Neves launches the Microsoft Windows Active Directory project to structure institutional data sharing through desktop networking.

MARCH

Science & technology

New rapid diagnostic assays to detect exotic Newcastle disease developed by a partnership of researchers at LLNL and other institutions “significantly aide” containment of the poultry disease.

Lab astrophysicist Diego Torres, working with an international group of researchers, publishes research indicating that high-energy neutrinos — particles that rarely interact with other matter — are produced in the accretion discs of neutron stars in amounts significant enough to be detected by the next-generation of neutrino telescopes.

Research by an LLNL climate scientist in collaboration with researchers from the University of Illinois and New York University determines that without large-scale development and deployment of carbon dioxide-emission-free energy technologies, the Earth could warm up to 10 degrees Fahrenheit during this century.

Scientists and managers from around the Laboratory gather to celebrate the opening of the new Physical Biosciences Institute, which serves as an incubator creating new research projects between the life sciences and other science and engineering disciplines.

People

Steve Hunt, associate director for Laboratory Services and an LLNL employee for more than 17 years, announces his plans to retire.

CIO Ken Neves and Mark Seager, assistant department head of Advanced Technology in ICCD, are named to HPC Wire’s list of “Top People and Organizations to Watch in 2003.”

Operations

Lab announces that construction work in preparation for controlling access to East Avenue between Vasco and Greenville roads will begin.

The University of California and the three Department of Energy national labs it manages receive strong support from a collection of California and New Mexico state legislators during a special hearing in Sacramento.

APRIL

Science & technology

Rep. Ellen Tauscher, LLNL Director Michael Anastasio and several Laboratory associate directors officially open the Radiation Detection Center with a ribbon-cutting ceremony.

An international research team, including LLNL scientists from the Joint Genome Institute in Walnut Creek, announces that the 13-year effort to



Rep. Ellen Tauscher looks on while Simon Labov speaks during ceremonies marking the opening of the Radiation Detection Center in April.

decode the human genome is essentially complete.

A 100 MeV accelerator under Bldg. 194 is used to create high brightness X-rays by a team of LLNL physicists and engineers. Their project is known as the Picosecond Laser-Electron Interaction for the Dynamic Evaluation of Structures (PLEIADES).

People

Simon Labov, who helped create the Laboratory’s Radiation Detection Center, is named the center’s first director.

California State Assemblyman Guy Houston of Livermore and U.S. Sen. Wayne Allard of Colorado, who is a member of the Senate Armed Services Committee, receive separate briefings and tours of the National Ignition Facility.

Operations

The National Ignition Facility is honored with two national safety awards of excellence.

A new ergonomics pilot program, administered through the Safety, Security and Environmental Protection Directorate, is made available to all LLNL employees.

Chemistry and Materials Science officially unveils a new office building (Bldg. 155) that is the centerpiece of the directorate’s new Isotope Science Facility project.

A groundbreaking ceremony is held to mark the start of construction on the new Central Café.

MAY

Science & technology

The Organization for the Prohibition of Chemical Weapons tells the Lab that it was the second U.S. facility certified to analyze samples collected during the challenge inspections conducted under the Chemical Weapons Convention.

Using a new analysis of satellite temperature measurements, Lab researchers discover that uncertainties in satellite data hamper the detection of human effects on climate.

The Joint Genome Institute and Diversa Corp. announce a collaboration to discover and sequence novel microbial genomes found in a diverse range of unique habitats.

Lab astronomers participate on an international research team that discovers “ultra-compact dwarfs,” a new type of galaxy.

Lab astrophysicist Gabriela Canalizo presents the

first detected signs of a merger in the powerful radio galaxy, Cygnus A.

People

Robert Lawrence, a board certified pathologist and son of Lab co-founder Ernest Lawrence, presents “Medical Aspects of Death Investigations” at the Lab.

Former deputy director Bob Kuckuck is awarded the DOE’s prestigious Secretary’s Gold Award in recognition of superior leadership while acting as principal deputy administrator for NNSA.

Maxine Trost becomes the first professionally trained archivist to head the Lab’s archives.

During “Bicycle Safety Month” at the Lab, Rick Ashabranner, a NIF contract worker, announces that he will bike the 2,976-mile Race Across America, which he completed in just under 10 days, averaging 21-22 hours per day in the saddle.

UC President Richard Atkinson announces his intention to appoint Pete Nanos the permanent director of Los Alamos.

Ambassador Linton Brooks speaks to UC Regents and Lab employees about DOE action on the contract to manage Los Alamos.

AX-Division physicist Richard Klein adds a visiting professorship at the University in England to his already busy work schedule, which includes teaching

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QUOTABLES

On the UC Contract

“I’m proceeding as if we’re going to compete this thing and we’re going to win.”
– Bob Foley, UC vice president for Laboratory Management, on the University bidding for the contract to manage the labs for DOE

“I don’t know who I would feel comfortable with except the University taking responsibility.”
– Robert Dynes, UC president, on the contract to manage the national labs

“We’re all very committed and devoted to the contractual relationship with the University of California. I understand it’s important to you and it’s important to me personally.”
– Lab Director Michael Anastasio, in discussing UC’s contract to manage the Lab during a January all-hands meeting

2003

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astrophysics at UC Berkeley — when he's not working at the Lab.

Operations

Secretary Spencer Abraham announces that the DOE intends to compete the management and operations contract for Los Alamos National Laboratory.

The EPA's Region 9 awards the Lab and NNSA two "Champions of Green Government Awards" for two pollution prevention projects: the Drain-Down Recovery Team and the Photovoltaic Team.

The Lab celebrates Asian Pacific Heritage Month with a keynote address by U.S. Rep. Mike Honda.

NIF sets a new safety record, surpassing 3 million work hours without any lost workdays.

NARAC participates in TOPOFF 2, the national terrorism drill, which involved a dirty-bomb explosion scenario in Seattle.

The Lab's emergency response operation conducts its annual emergency exercise.

The Laboratory Services Directorate sponsors "Live Safety Daily," a Safety Fair that invites all employees to participate



Homeland Security Secretary Tom Ridge, left, made his first visit to the Lab in July, where he received briefings on Lab technologies to assist in the war on terrorism. Ridge also met with the media.

JUNE

Science & technology

NIF sets a world record for laser performance, producing 10.4 kilojoules of ultraviolet laser light in a single beamline.

By studying the sun's surface, Lab physicists help to unlock the key to why and how sharp temperature jumps occur in the solar atmosphere, and what makes the solar transition region so erratic.

DNT announces the licensing of its hand-held RadScout radiation detection and identification device to ORTEK, a division of AMETEK.

Lab physicists produce X-ray emission in a laboratory setting by recreating the conditions that exist when solar winds collide with gases surrounding comets.

"Sizzlin' Summer Science" offers community members free, fun, family educational science lectures.

People

The UC Board of Regents selects UC San Diego Chancellor Robert C. Dynes as president-designate.

"Brotherhood of the Bomb" author Gregg Herken discusses the origins of the Lab during his Director's Distinguished Lecture Series presentation.

Russian ambassador Yuri Ushakov visits Livermore.

Director Michael Anastasio appoints Dave Leary

as new director of the Safeguards and Security organization.

Pedro Luis "Pete" Estacio is presented with the Secretary's Award for Distinguished Service for his work with the Bioterrorism State and Local Preparedness Coordination Group.

Navy Captain Lorrie Sammons speaks about the role of women in the U.S. armed forces in a presentation titled "This Is Not Your Mother's Military."

NNSA's Linton Brooks presents NIF Project Manager Ed Moses with the Award of Excellence for his vision, planning and leadership.

Retirement was the order of the day for a cadre of tenured Lab senior managers that included Steve Hunt, Jens Mahler and Bernie Mattimore.

Sign language interpreter, manager of the Disabilities Services Program and breast-cancer survivor Cathy McClain shares some of her wisdom in a motivational talk, "Who's on First?" The talk was part of the Cancer Awareness Campaign.

LLNL's seven-man security police officer Shooting Team, nicknamed "The Lab Rats," places eighth in the National Security Police Officer Training Competition in New Mexico.

Operations

The UC Davis Department of Applied Science commemorates 40 years of instruction at their campus on the Livermore site.

Work begins to install a right-turn inlet into Site 300 to improve safety and ease the congestion as employees enter the site during rush-hour times, when vehicles frequently speed along Corral Hollow.

JULY

Science & technology

The Lab receives six prestigious R&D awards in the annual R&D 100 competition for the leading industrial inventions worldwide.

The "2004 Guinness World Records Book" lists an aerogel developed at LLNL as "the world's least dense solid." With a density of just 1.9 milligrams per cubic centimeter, the substance wrests the record from the Jet Propulsion Lab's denser 3 mg/cc version of aerogel.

Scientific American reports on a study of black holes in space by Lab physicist George Chapline and colleagues at Stanford, suggesting that matter behaves differently from what is predicted by classical general relativity.

Lab scientists release a study blaming human-induced changes in ozone and well-mixed greenhouse gases for much of the recent change in the height of the Earth's atmosphere known as the tropopause.

DNT's JASPER gas gun at the Nevada Test Site achieves a major milestone, as the nearly 100-foot,

two-stage device fires its first successful plutonium shock-physics shot as part of the Stockpile Stewardship Program.

People

President Bush honors Director Emeritus Edward Teller with the prestigious Presidential Medal of Freedom, the nation's highest civil honor.

Pete Nanos, who had been serving as interim director of Los Alamos National Laboratory, is named permanent director by the UC Board of Regents.

Homeland Security Secretary Tom Ridge makes his first visit to the Lab, and is briefed on technologies to assist in the war on terrorism.

John Elmer of the Chemistry and Materials Science Directorate is named a 2003 American Society for Metals (ASM) Fellow in recognition of his innovative contributions to the use of synchrotron radiation to welding science.

Lab retiree Mike MacCracken is elected president of the International Association of Meteorology and Atmospheric Sciences of the International Union of Geodesy and Geophysics.

Operations

NNSA Administrator Linton Brooks announces a five-part initiative to reinforce current safeguards and security oversight and strengthen long-term security operations in the nuclear weapons complex. He also establishes two review groups to assess longer-range issues affecting security management and protection.

Security procedures are upgraded after a Protective Force officer reports losing a set of keys that turn up after an exhaustive search. Officers begin wearing special new key lanyards to prevent a reoccurrence.

AUGUST

Science & technology

New mass spectrometric measurements from the Lab's Center for Accelerator Mass Spectrometry help reaffirm the accuracy of earlier studies on the radiation absorbed by survivors of the Japanese atomic bombs.

By analyzing the genomes of several microscopic ocean-dwelling organisms sequenced at the Joint Genome Institute, scientists discover that four types of "photosynthetic" microbes derive energy from sunlight, just like plants.

Using a 6,000-ton detector, Lab scientists begin gathering data on neutrinos as part of the Main Injector Neutrino Oscillation Search, (MINOS).

In a landmark event in the experimental investigation of plutonium, Lab scientists announce they and a team of collaborators have fully mapped the phonons

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QUOTABLES

On national security

"One of the advantages we have in the war on terrorism is being more creative than any other group of people in the world. We lead the technology revolution."

— Tom Ridge, Homeland Security secretary, during visit to the Lab

"Lone domestic terrorism causes just as much damage as the foreign terrorism you're hearing about on the news today and it's the hardest type to stop."

— Terry Turchie, SAFE program manager

"RadScout puts the ability to detect radiation in the hands of the people who need it most, our emergency responders."

— Bruce Goodwin, associate director, Defense & Nuclear Technologies

2003

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in gallium-stabilized delta plutonium, an experiment that promises to reveal much about the physics and material properties of plutonium and its alloys.

Lab physicist Olgica Bakajin, in collaboration with an international team of researchers, announces development of an experimental method that allows scientists to investigate the behavior of proteins under nonequilibrium conditions one molecule at a time, to better understand a fundamental biological process of protein folding that is important for many diseases.

People

Lab Director Michael Anastasio announces plans to restructure the 100 series job classifications, including non-management exempt administrative and specialist jobs.

Steven Patterson returns to the Lab to serve as associate director for Engineering, after a stint as a distinguished professor of precision engineering at the University of North Carolina at Charlotte.

Maj. Gen. Robert Smolen, director of nuclear and counterproliferation for the U.S. Air Force, tours the Contained Firing Facility at Site 300, as part of a day-long visit to the Lab for briefings on nuclear weapons, nuclear surety, counterproliferation and planning.

The Lab whisks more than 170 guests on tours through the National Ignition Facility and the Decontamination Waste Treatment Facility as part of the Laboratory's Special Community Leader Day.

The PSO Color Guard, units from the Lab's Fire Department and members of the LLNL Armed Forces Veterans Association participate in Operation Welcome Home, a parade and picnic in downtown Livermore to celebrate the return of U.S. troop units from Iraq and Afghanistan.

The National Association for the Education of Young Children (NAEYC), the nation's largest organization of early childhood educators, accredits the LLNL Employee Services Association (LLESA) Children's Center, which provides year-round services for children of LLNL, Sandia and DOE employees.

Stefan Mogl, head of the Organization for the Prohibition of Chemical Weapons (OPCW) Laboratory in The Hague, The Netherlands, visits LLNL, which is one of only two U.S. labs designated to analyze samples collected during challenge inspections conducted under the Chemical Weapons Convention treaty.

Operations

Access to East Avenue between Vasco and Greenville is limited to provide an added measure of security for LLNL and Sandia.

The Lab breaks ground for the new Bldg. 142, which will serve as a permanent structure to replace older trailers in the adjoining area.

LLNL personnel are warned about the recent sighting of a mountain lion along the Arroyo Seco at Sandia.

SEPTEMBER

Science & technology

The JASPER gas gun, located at the Nevada Test Site, fires a successful equation-of-state experiment on a plutonium target fabricated at the Livermore Plutonium Facility. It is the second successful shot for JASPER.

The Center for Global Security Research concludes a series of workshops in Washington DC on "Atoms for Peace," a look at the world 50 years after President Eisenhower's visionary speech.

Lab scientists study super sensitive monitors in Norway as a method for determining whether seismic activity in Russia or Sweden is caused by an earthquake or nuclear explosion.



Edward Teller and Shirley Petty examine the Presidential Medal of Freedom that Teller was awarded for his lifetime achievements, during a reception in his honor in August. The medal is the nation's highest civilian honor.

Fusion scientists from around the world praise the National Ignition Facility during a special tour stop of the Third International Conference on Inertial Fusion Sciences and Applications.

Lab researchers find that continued release of carbon dioxide over the next several centuries would increase ocean acidity more rapidly than during the past 300 million years, resulting in damage to marine life. Ken Caldeira and Michael Wickett lead the research team.

Lab astronomer Kem Cooke and an international team of astronomers discover that the Large Magellanic Cloud appears to have formed with an old stellar halo, similar to how the Milky Way was formed.

People

Director Emeritus Edward Teller died at his Stanford home on Sept. 9. He was 95. For more on Teller see the Web at http://www.llnl.gov/llnl/06news/News-Media/teller_edward/teller_index.html

Jim Carothers, one of the first staff members at the Lab when it opened its doors in 1952, died Sept. 7, at the age 80. Carothers served as associate director of the Nuclear Test Program, associate director of Human Resources and the first Lab archivist, among other assignments.

Dave Leary is named associate director of Laboratory Services, replacing Steve Hunt, who retired in summer. Leary continues to head up Safeguards & Security.

Larry Suter, who heads up the Lab's Hohlraum Dynamics Group of the Theory and Target Design Division, receives the American Nuclear Society's 2003 Edward Teller Award during the Third International Conference on Inertial Fusion Sciences and Applications in Monterey.

The Lab Women's Association elects its new officers: Chelle Clements, president; Deborah Irish, vice president; Christine Bell, secretary; and Linda Farber, treasurer.

Operations

The Laboratory dedicates the Edward Teller Education Center, devoted to improving science education through professional development of educators and hands-on programs. The ceremony is a fitting tribute to Edward Teller, who died hours after the center's dedication.

The University Relations Program hosts a visit by 40 UC Davis faculty and staff members to explore future collaborations.

DOE proposes a new policy on polygraphs, one in which the number of individuals subjected to such testing would be reduced.

Innovative Business and Information Services wins three awards from the Society of Technical Communications.

Director Michael Anastasio unveils a new Institutional Information Technology Program. Lab CIO Ken Neves leads the program to develop a comprehensive institutional information technology strategy and aggregate key IT processes across the Laboratory.

The Laboratory adopts a streamlined review and release process, called Information Management.

More than 120 California science teachers come to the Lab for the Edward Teller Science & Technology Education Symposium. The two-day event helps educators develop science curricula.

OCTOBER

Science & technology

Lab researchers detail efforts to discover the structure of the genome at the atomic scale. The exploratory research project, led by physicist Henry Chapman, uses X-ray free electron lasers to attain atomic resolution imaging of virtually any macromolecule, protein or virus.

Lab scientists at the Nevada Test Site successfully complete the "Piano" subcritical experiment. Piano examined the behavior of a flat plutonium plate as the metal was shocked with high explosives.

Approximately 20 Northern California agencies and institutions, including the Lab, gather in San Francisco to discuss ways to prevent terrorist attacks in the Bay Area and how to minimize the effects of such attacks, should they occur.

The Lab is awarded six R&D 100 awards at the annual R&D 100 banquet in Chicago. (See box below.)

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QUOTABLES

On the Teller commemoration

"Edward Teller helped shape the course of human history."

— President George W. Bush, on presenting the Presidential Medal of Freedom

"He was a major part of the flowering of American science...Edward Teller didn't just make a difference, he made a gigantic difference."

— George Shultz, former secretary of state, delivering eulogy at Teller commemoration ceremony

"In the end, he contributed to the greatest experiment of all, that of our representative democracy."

— Kyle McSlarrow, DOE deputy secretary, on Edward Teller

"Teller understood that to compromise in the face of injustice is to abandon your values, your integrity and your dreams."

— Ferenc Gyurcsany, Hungarian Minister of Youth and Sport

"Anybody who knew him, knew Dr. Teller plowed his row to the end."

— John Foster, former LLNL director

"Edward Teller had an unshakable faith in the power of science and technology to improve the world and the human condition."

— Bruce Tarter, associate director at large

2003

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A major milestone in astronomical history takes place at the Keck Observatory when scientists use a laser to create an artificial guide star on the Keck II 10-meter telescope to correct the blurring of a star with adaptive optics. Guide stars have been used on smaller telescopes, but this is the first successful use on the current generation of the world's largest telescopes.

The Laboratory announces its 2003 Science and Technology Awards: one to a team of scientists that carried out the first-ever measurements of the phonon dispersion curves in plutonium and another award for a scientific team that developed a highly optimized high-throughput sequencing process for the Human Genome Project. Joe Wong leads the plutonium team and Susan Lucas leads the genome project.

A Hawaii-based company, Ho'olana Technologies, begins production of a chemical diagnostic kit based on Lab technology that allows the U.S. military to test the safety of munitions.

People

New UC President Robert Dynes, former chancellor of UC San Diego, assumes office.

Adm. S. Robert Foley is appointed by the UC Regents as vice president of Laboratory Management.

Seymour Sack of B Division is one of three winners of the prestigious Enrico Fermi Award. Sack receives the award for his lifetime contributions to national security.

Former Director Bruce Tarter is elected fellow of the American Association for the Advancement of Science. Tarter is honored for his leadership of the Laboratory in "transforming the science base for post-Cold War national security."

Steve Hatchett of the Defense and Nuclear Technologies Directorate is named an APS fellow.

Optical physicist Gary Sommargren receives a Lifetime Achievement Award from the American Society for Precision Engineering.

Jack Campbell, group leader for Advanced Optical Materials for the National Ignition Facility, wins the George Morey Award from the American Ceramics Society.

Francois Heuze of Energy and Environment is elected vice president of the International Society for Rock Mechanics.

T.G. Nieh of the Chemistry and Materials Science



BASIS features air samplers that suction air through filters and thereby collect any regional microbes onto a filter's surface. Above, the bar code of a single filter is scanned.

Directorate is named a fellow of the Minerals, Metals & Materials Society.

Operations

UC announces health plan premiums will increase in 2004, due largely to skyrocketing medical costs.

The Laboratory, Alameda County Office of Emergency Services and the Livermore Pleasanton Fire Department unveil a new emergency response guide, which is mailed to all Tri-Valley residences.

The Atomic Testing Museum opens in Las Vegas, providing a glimpse into the history of nuclear weapons tests at the Nevada Test Site.

The Hard Hat Café opens at the Central Café, as operations there begin to shut down and transition to the new cafeteria, which will open in 2004.

The Laboratory kicks off its annual HOME Campaign to Help Others More Effectively. The Campaign's goal is \$1.5 million.

The Laboratory and the U.S. Air Force sign a memorandum of agreement that paves the way for Air Force officers to combine defense-related professional military education and advanced degrees with the University of California.

The Laboratory Fire Department dispatches two engines and eight firefighters to join the battle against several wildfires raging throughout Southern California. In total, the Lab dispatches 21 engines and 70 firefighters throughout Alameda County as part of its mutual aid agreement to handle dispatch for the county.

A cougar is spotted walking the outskirts of San-dia.

NOVEMBER

Science & technology

The Laboratory's Center for Global Security Research hosts the conference concluding a yearlong series of workshops on "Atoms for Peace After 50 Years: New Challenges and Opportunities," inspired by President Dwight Eisenhower's visionary speech to the United Nations in 1953.

Lab climate scientist Ken Caldeira is one of a trio of scientists that publish findings in *Science* indicating that humans may owe the relatively mild climate in which their ancestors evolved to tiny marine organisms made out of calcium carbonate.

The Lab's Pat Fitch, Ellen Raber and Dennis Imbro publish a review paper in *Science* calling recent technology development to counter biological and chemical terrorism "unprecedented," but note important challenges remain.

A team of Lab computer scientists earns the "Both Directions Award" at SC 2003 by winning the Bandwidth Challenge, a competition between supercomputing facilities to transfer massive amounts of data from one location to another.

People

A special commemoration ceremony in honor of Dr. Edward Teller is held at the Laboratory. George Shultz, secretary of state under President Reagan, delivers the keynote eulogy.

New UC President Robert Dynes and newly appointed Vice President for Laboratory Management Bob Foley address Lab employees in an all-hands meeting.

Energy Secretary Spencer Abraham announces DOE Office of Science 20-year science facility plan.

Susan Eisenhower, granddaughter of President Dwight D. Eisenhower, delivers the keynote address at the Center for Global Security Research "Atoms for Peace" conference.

David Eaglesham of CMS is made president-elect of the Materials Research Society.

Merna Hurd is appointed special assistant to UC Vice President for Lab Management Bob Foley.

1997 Nobel Laureate for Physics William Phillips delivers an animated DDLS talk on the use of lasers to cool atoms to very low temperatures.

George Sakaladasis of the Lab's National Security Office reflects on his U.S. Air Force career in a special Veterans Day presentation.

Lab Executive Officer Ron Cochran, Fire Chief Randy Bradley, Battalion Chief Jim Watkins and Barry Schrader of Public Affairs attend the inauguration of Gov. Arnold Schwarzenegger in Sacramento.

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QUOTABLES

On science and technology

"Awesome!"

— George Shultz, former secretary of state, after a tour of NIF

"We were heretics. They used to laugh us out of talks."

— Computer scientist Eugene Brooks, on the Lab's early commitment to parallel processing

"Everybody's in shock right now. This was quite a blow to the whole world's astronomy community."

— Kem Cook, of LLNL's IGPP, upon hearing news that the Great Melbourne Telescope was destroyed in a fire

"LDRD nurtures the science and technology that form the foundation of the Laboratory and helps attract future generations of scientists and engineers."

— Rokaya Al-Ayat, associate deputy director for Science and Technology

"The cooperation between researchers of our two countries represents the finest aspects of the universality of science."

— Michael Anastasio, during Lab visit by Russian ambassador Yuri Ushakov

"The microbial world is the next genomic frontier."

— JGI Director Eddy Rubin

"Simply put, sperm slow down with age."

— Andrew Wyrobek, head of the Lab's Health Effects Genetics Division, who co-authored a study relating semen quality to age

Award-winning technology

- ◆ Biological Aerosol Sentry and Information System (BASIS) for biodetection
- ◆ Lasershot Precision Metal Forming for laser peening aircraft components
- ◆ Micro-Electro-Mechanical Systems-Based Adaptive Optics Phoropter to enhance vision and treat retinal diseases
- ◆ High-Average-Power Electro-Optic Q Switch, increasing the power-handling capabilities of lasers
- ◆ Extreme Ultraviolet Lithography Full-Field Step-Scan System, to improve computer chip speed. The EUVL team also receives a special "Editor's Choice Award" for outstanding achievement among all R&D 100 winners
- ◆ Ion Beam Thin Film Planarization, for defect-free reticles or masks on computer chips.

2003

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Operations

The UC Board of Regents approve the creation of a board of directors to oversee the national laboratories.

The UC Board of Regents approve a tentative settlement in a class action lawsuit alleging gender disparities in pay and promotion at the Lab.

HOME Campaign 2003 gets under way.

The Lab proposes to change extended workweek-related policies.

DECEMBER

Science & technology

In his state of the Lab address, Director Michael Anastasio announces development of the first phase of the long-range strategic investment plan for science and technology.

The Lab's BioSecurity and Nanosciences Laboratory holds an open house.

A blue ribbon DOE commission suggests management contracts for DOE labs should be competed, but that science and technology should be key factors for determining who wins those contracts.



Andrew Quong, deputy director of the BSNL, explains how the BioAerosol Mass Spectrometer (BAMS) identifies airborne particles at the single-cell level.

People

Lab physicists John Castor, Giulia Galli, Stephen Hatchett, Richard Klein, Christian Mailhot and Erich Ormand are named Fellows of the American Physical Society, making the Lab home to one of the largest selections of fellows in a single year.

Physicist Siegfried Glenzer receives the American Physical Society's 2003 Award for Excellence in Plasma Physics Research.

Russ Miller is named department head for Safeguards and Security by Dave Leary.

Operations

Associate Directors Jan Tulk and Dave Leary announce a reorganization moving Innovative Business and Information Services (IBIS) to the Administration and Human Services Directorate. Under the reorganization, Lab Counsel and the Audit and Oversight Office report directly to Director Michael Anastasio.

The HOME Campaign tops its goal of \$1.5 million in donations.

The Lab in conjunction with UC announces it is seeking comment from employees on draft whistleblower procedures.

Mountain lions are sighted in the vicinity of the Laboratory.

QUOTABLES

People talking

"But this is like a kick in the stomach. We were just shell shocked. To lose your family 15 minutes before landing is such an incredible tragedy."

— Jeff Wisoff, discussing the Columbia Space Shuttle tragedy

"...but after being diagnosed, I learned it was OK to put me first. Society allows us the freedom to step out of our traditional roles."

— Cathy McClain, on her experience with breast cancer

"It was 46 seconds of adrenalin rush."

— Ron Cochran, on winning Livermore Rodeo's team greenhorn penning competition

"The saddle of a bicycle is a great place to just think. How often in our regular routines can we get several uninterrupted hours to do that?"

— Rick Ashabranner, before embarking on the 2,976-mile Race Across America

"People were a bit leery when I started ... I am the one who has to live with this impairment and it shouldn't have to change your personality. It doesn't change the things I want to do in life."

— Howard Ellis of Plant Engineering, who is legally blind

"I was still a student, so for me that was beer and rent money."

— John Knezovich, on being a student researcher at the Lab in 1977

OVERVIEW

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special hearing in Sacramento.

Security

Key security changes were also made in 2003, including controlled access to East Avenue between Vasco and Greenville roads. Construction began in March and "limited access" was instituted in August to provide an added measure of security for LLNL and Sandia. Other security measures included:

- In July, NNSA Administrator Linton Brooks announced a five-part initiative to reinforce current safeguards and security oversight and strengthen long-term security operations in the nuclear weapons complex. He also established two review groups to assess longer-range issues affecting security management and protection. At the same time, security procedures at the Lab were upgraded after a Protective Force officer reported losing a set of keys that turned up after an extensive search. Officers began wearing special new key lanyards to prevent a reoccurrence.
- In September, DOE proposed a new policy on polygraphs, one in which the number of individuals subjected to such testing would be reduced.

Work/Life

Key work/life balance changes in 2003 focused on rolling out several programs and projects that resulted from the Employee Survey including:

- Rollout of the Integrated Performance and Pay Program.
- A new ergonomics pilot program, administered through the Safety, Security and Environmental Protection Directorate.
- Construction of a new Central Café scheduled to open in early 2004.
- A streamlined review and release process, called Information Management.

New facilities

Several new buildings broke ground and were dedicated:

- Chemistry and Materials Science officially unveiled a new office building (Bldg. 155)

that is the centerpiece of the directorate's new Isotope Science Facility Project.

- In the fall, the Laboratory dedicated the Edward Teller Education Center, devoted to improving science education through professional development of educators and hands-on programs.
- In August, the Lab broke ground for the new Bldg. 142, which will serve as a permanent structure to replace older trailers in the area.



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